

ABSTRACT OF THE DISCLOSURE

The present invention includes a method for thermal management in a voltage source inverter. The method includes sensing a low output frequency condition, determining a zero vector modulation responsive to the sensed low output frequency condition, and applying the determined zero vector modulation to reduce thermal stress in the voltage source inverter. The step of determining the zero vector modulation responsive to the sensed low output frequency condition includes mapping an output voltage requirement to a space vector structure and determining state switching space vectors based on the mapped output voltage requirement. The step of determining the state switching space vector includes determining active state switching space vectors associated with the state switching space vectors, determining duty cycles for the active state switching space vectors based on the active state switching space vectors, and determining a duty cycle for at least one zero state switching space vector based on the determined duty cycles of the active state switching space vectors and a switching period.